

Clark (H. G.) Dr Smith  
North basement  
Tremont House

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DR. CLARK'S ADDRESS

BEFORE THE ]

SUFFOLK DISTRICT MEDICAL SOCIETY,

APRIL 24, 1852.

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SUPERIORITY OF SANITARY MEASURES OVER QUARANTINES.

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AN

# ADDRESS

DELIVERED BEFORE THE

SUFFOLK DISTRICT MEDICAL SOCIETY

At its Third Anniversary Meeting,

BOSTON, APRIL 24, 1852.

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BY

HENRY G. CLARK, M. D.

ONE OF THE SURGEONS OF THE MASS. GENERAL HOSPITAL.

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## A D D R E S S .

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*MR. PRESIDENT AND GENTLEMEN;*

It was, I assure you, only after much hesitation that I have persuaded myself to accept the very kind invitation extended to me by your Committee to address you on this occasion.

In presenting to you my sincere acknowledgments for the honor you have done me, I must be permitted, at the same time, to express my regret that your choice had not fallen upon some other one, of the numerous members of this Society, more competent than myself either to instruct or interest you. Considering it, however, to be the duty of every member of an association like this to contribute, whenever called upon, according to his ability, for the promotion of its important objects; I did not feel myself entirely at liberty to decline acceding to your request.

Various circumstances — with which some of you are doubtless well acquainted, and to which, on that account, it is not necessary that I should more particularly refer — have concurred to attract my attention, in no inconsiderable degree, for several years past, to the measures of *Sanitary Reform* which have been proposed and adopted in the old world, especially in Great Britain; and to the evidence of their superiority in arresting the spread of Epidemics, or of the malignant Endemics, over the older, and, as we may now hope, obsolete systems of Quarantine; and, as one is very apt to believe that others may be brought to take an interest in what nearly concerns himself, I have selected this subject for your consideration this evening.

Neither the time nor the occasion will suffice for any thing but the most cursory examination of the merits of this question, or of scarcely more than a passing allusion to the many interesting collateral issues which are connected with it. But, although I cannot hope to do even partial justice in exploring so extensive a field, if, as the result of this attempt to determine the present position of Sanitary

Science, the sympathies of the profession are attracted towards it in a degree at all commensurate with its great importance, I shall be quite content.

Every member of the Society must have had some cognisance of the fact that, during the last twenty-five years, a very radical change has taken place in the minds, not only of medical men, but especially of intelligent commercial men, in respect to their estimate of the value and necessity of Quarantines.

The result, as you well know, of this conviction, so slowly but surely arrived at, has been a gradual relaxation of their stringency, and a very general practical reliance upon other and more rational means.

But while there is an almost universal belief in the correctness of these conclusions, the grounds upon which they stand, and the arguments by which they are supported, may not be so familiar as to render a re-statement of them entirely useless.

As preliminary to an examination of some of the particular measures of sanitary reform, let us first consider how far Quarantine Regulations have accomplished the purposes for which they have been

enacted, and in what respect they have wholly failed to do this.

The theory of the operation of Quarantines is based upon the assumption, that, by a complete isolation of all persons actually sick of diseases supposed to be contagious, as well as of those, who, together with their effects, have been exposed to the causes of such sickness, their further spread may be prevented, and their mischievous consequences confined within the charmed circle of a sanitary cordon.

It should be observed that this theory assumes, also, that all the diseases against which Quarantines are especially established are propagated by contagion *only*; a position which is controverted by the strongest and most abundant testimony. The simple fact, that epidemics and contagious diseases have, in spite of these attempts to imprison and destroy them, continued, with a vigorous and marvellous activity, to spread themselves from time to time, over every quarter of the habitable globe, amply proves it. What has been the effect of these endeavors? Precisely the reverse of what could be desired, but, at the same time, precisely

what might have been expected. The poison of disease has been concentrated and accumulated — its malignant qualities intensified — its expansive power exalted, till, like impacted gunpowder, when the fire at last reaches it, the explosion is terrific in proportion to the strength of the materials which have been employed to confine it.

Quarantines have been more or less known in all countries from the earliest periods of civilization ; and we know that they have often been enforced with all the energy of which the most despotic governments, under the stimulus of the liveliest terror, were capable ; so that, if they shall be found in any sense to have failed, this failure must be ascribed to the system itself, rather than to any defects in its administration. Take the following extract from Dr. Laidlaw's statement to the Board of Health in London, as a specimen of the mode. Speaking of the plague in Alexandria, he says : "As soon as the disease was ascertained to exist in the town, all the European inhabitants put themselves in quarantine, and nothing was received into their houses without being previously smoked or passed through vinegar and water. The most abominable system

of annoyance to the inhabitants was adopted by the sanitary police, in the hope of stopping the propagation of the malady. Every house in which the disease was discovered was instantly closed, and guards placed around it, the miserable inhabitants being removed to the Lazaretto. One of the first cases of plague occurred in the European Hotel, which was frequented by great numbers of Europeans. The sanitary police, with a large body of soldiers, entered at the usual hour for dining, and actually seized, in defiance of all law and justice, upwards of forty persons, the great majority of whom had only entered a few minutes previously for the purpose of dining, and carried them off to a miserable lazaretto, where no sort of comfort, and scarcely the necessities of life were afforded them, to perform an expurgation of forty days. The surgeon, also, who attended the patient, was put in quarantine for the same period. Notwithstanding, however, the severity with which police regulations were enforced under the despotic and irresponsible direction of a Board of Health, notwithstanding that every vessel coming from a suspected port was subjected to a strict quarantine, in order to prevent any new

importation of the suspected virus, still the epidemic steadily pursued its course, just as it had always done before, when none of these precautions were adopted, daily increasing the number of its victims as the season favorable for its propagation advanced, until it was found that the shutting up of infected houses was worse than useless, and the Pacha, more humane than the infatuated Europeans who advised him, ordered that all further attempts to stop the progress of the disease by [such] sanitary regulations should be abandoned. It is not unreasonably conjectured that during the above-mentioned period, great numbers of persons died of plague, who were buried in their dwellings by their relatives, in order to avoid the nuisance of quarantine; and from the decomposition of their bodies a new contamination was thus constantly added to the vitiated atmosphere. Thus ended," concludes he, "a most decided attempt, backed by all the authority of despotic power, and exercised with the most merciless severity, to arrest by quarantine the progress of the disease." \*

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\* Dr. Laidlaw's evidence before the General Board of Health. Parliamentary Report.

Many of us, not yet old, well remember the severity of our own quarantine laws, and the rigidity with which they were enforced, in relation to small-pox. It can hardly be credited now, that within so short a period as fifteen years, our wealthiest and most respectable citizens, possessing the means of luxurious comfort at home, — mothers of children who were able and willing to care for them, and to procure for them the best medical attendance and nursing, — even children of tender years, — were liable to be, and have sometimes been, taken by the strong arm of municipal law, in mid-winter as well as in mid-summer, to the hospital at Rainsford Island, where, more fortunate than our friends at Alexandria, through the careful management of the Quarantine physician\* and his assistants, they usually recovered ; — were then, together with their clothing, thoroughly fumigated with burning sulphur, and in due course afterwards returned to the city and their homes. Several physicians within my recollection, belonging to this association, being ornamented with a few variolous pustules, “contrary to the statute,” have been served in the same manner.

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\* Dr. J. V. C. Smith.

Under some circumstances we may conceive of such an event as being not wholly disagreeable; but, in the majority of cases, it was doubtless an intolerable nuisance. We are indebted to the wise recommendation of the consulting physicians of the city in the year 1840, and to the intelligent action of the Mayor and Aldermen thereupon, for its abatement.

The diseases, which have awakened, on the score of contagion, the strongest sentiments of fear among all classes of the community, and which have consequently been considered to be the most suitable subjects for the application of the quarantine laws, have been the Plague, Cholera, and Variola. The addition of Typhus and Yellow Fever will, I believe, make the list of diseases included in this category complete.

But have we any authentic evidence that the mortality of either of them has been, in any degree, abated by these measures? Has the Plague been annihilated? Has Variola? Did it not, before the discovery of vaccination, annually sweep off its thousands? How was it with the Cholera? Leaving its birth-place in the East, did it not overleap,

without a touch, impassable mountain chains? — even the Atlantic ocean? spreading like an uncontrolled conflagration over the length and breadth of this vast continent?

If such mighty natural obstacles were unavailing, what could be expected of any mere human “intervention?”

It must be conceded by all parties, I presume, if the diseases against which quarantines have been established, can be shown to be non-contagious, that the strongest apparent argument in favor of them is at once destroyed.

If it is not necessary, in order to prove any disease to be contagious, that it should inevitably be communicated to all within the sphere of its influence, neither should its non-contagious character require for its establishment an entire immunity on the part of those persons who are equally exposed to other adequate causes of disease.

In making up a judgment upon the contagious nature of any disease, we ought to consider what are its usual tendencies, and to separate, carefully, the accidental and accessory facts, from those which are essential and constant; because the ef-

fects of epidemic or of local causes are very liable to be mistaken for, and attributed to, the contagious influence of a prevailing disease. But no disease should be admitted to be contagious which does not generally, or at least, with some uniform frequency, reproduce itself in the bodies of those healthy but unprotected persons, who, in situations remote from the original source of the sickness, are directly exposed to it by an actual contact with the sick.

There was formerly a very general belief in the contagious nature of the plague. In this port even, vessels arriving from the Mediterranean, when this pestilence was prevailing in any of the cities of the Levant, were often subjected to a quarantine which was as annoying and expensive as it was useless; because, although these laws have now been abrogated for more than twelve years, and that, during this time, it has frequently prevailed, no one has ever seen or heard of a solitary case in this country.

In Egypt it often prevails at Cairo, when there is nothing of it in Alexandria; and often at Alexandria when there are no cases of it at Cairo,

and this, notwithstanding a constant communication being kept up between these two cities.\*

Clot-Bey, the French surgeon, and the celebrated physician-in-chief of Mehemet Ali, Viceroy of Egypt, in his work upon that country, declares himself to be distinctly opposed in opinion to those who believe in the contagious or infectious properties of the plague. Dr. Bowring, the very intelligent agent of the British Government in the Levant, speaks of him as "A man whose services to knowledge and humanity, in that country, outstrip all meed of praise;" and states, that "He assured him that, in the facts of which he had cognisance, he had found irresistible evidence against the prevalent opinion as to the contagious nature of this disease; that, removed from the regions of malaria or miasmata, he had never known the plague to be communicated by contact; that all his attempts to communicate the disease had failed; that he had twice inoculated himself from the pus and blood of plague patients without receiving the disorder; the experiments made, of wearing the clothes of those who had died of the plague,

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\* Dr. Laidlaw.

had shown the difficulty, if not the impossibility, of communicating the disease; that he deemed lazarettos and quarantines not only useless, but pernicious."

Mr. Gliddon, who, however doubtful a position he may hold in this meridian, in regard to his accurate knowledge of the inhabitants of ancient Egypt, has had most excellent opportunities for studying the natural history of the plague in that country, confirmed to me in the fullest manner the statements of Dr. Bowring, above quoted; adding, that, so far he knew, it was almost entirely confined to the overcrowded and filthy quarters of the town where it originated, and to persons whose irregular habits rendered them susceptible to the influence of any epidemic disease. He had an idea, which I presume was not original to him, that the plague had been developed in consequence of the discontinuance of the custom of embalming the bodies of the dead. How much foundation there is for such an opinion, I have no present means of judging. It is a very reasonable theory.

The conduct of Napoleon, in regard to those sick of plague in his Egyptian campaigns, however

it may be open to criticism in some respects, furnishes at least good evidence, either of the non-contagiousness of the plague, or that he was a disbeliever in it; and it is fair, of course, to infer that his opinion was but the reflection of that of the Baron Larrey, his famous surgeon-in-chief.

Some of the facts and experiments in relation to Plague, as reported in the "Minutes of Evidence upon Quarantine," before the General Board of Health of Great Britain, are so pertinent that you will excuse me for introducing them.

Mr. Abbott, an English surgeon in the employment of the Pacha, says, "I myself not only touched my patients every quarter of an hour, but obliged my assistants to touch them, and also to sit upon their beds, and there to remain until relieved, to administer the remedies prescribed. Neither I nor my assistants were attacked by the disease." "I have known," says he in another place, "several medical men, who, while the plague was raging with its greatest violence, persisted in making post-mortem examinations of plague patients, escape without taking the disease."

Dr. Laidlaw once tied the external iliac artery

upon a plague patient whose femoral artery had given way in consequence of the disease. He not only escaped the plague, but had also the satisfaction of saving his patient. Dr. Pezzoni says, that "Nurses, and other persons employed in plague establishments, appear to be invulnerable to the disease, since they remained both day and night with plague patients in perfect impunity, dressing their wounds, making their beds, and rendering them every sort of help."

Mr. Abbott says that "He never used any kind of fumigations, oiled-silk gloves, nor any other absurdities."

The foregoing facts, it will be observed, relate chiefly to the possibility of the communicability of the plague by actual contact with the sick ; of course, the settlement of this question in the negative, carries with it that of the doctrine of its propagation by means of merchandise, "a notion which," in the opinion of a most competent authority, "is entirely unfounded."

I have quoted these statements thus freely, because they not only show how uniform and conclusive is the testimony in regard to the non-contagiousness

of plague; but they are the precise counterparts to the statements in regard to several other diseases reputed to be contagious, such as cholera and yellow fever, and the substitution of the term 'cholera,' or 'fever,' for that of 'plague,' whenever it occurs in them, would adapt the evidence as truly to the one class of cases as to the other.

With regard to Cholera, it was at first universally considered to be contagious; but a greater familiarity with it has shown the contrary opinion to be the true one. In India, where Cholera first appeared, this conclusion was very early arrived at.

The city of Hamburg, according to Mr. Grainger, the author of the Sanitary Report on Cholera as it prevailed in London in 1848 and 1849, is entitled to the credit of first legislating practically upon this theory, in advance of any other city. Having been, in former epidemics, put to very great expense and inconvenience to establish and maintain separate hospitals for cholera, the authorities determined that such cases as could not be well provided for at home, should be admitted into the General Hospital. This institution accommodates sixteen hundred patients, and there were admitted into it, during the

epidemic, three hundred persons sick with cholera. Not a single patient left the house — not a nurse declined to do duty — and the disease was communicated to no one of its inmates. The immense advantages presented by such institutions, over those erected hastily or fitted up during the progress of an alarming disease, are too obvious to be questioned. The single objection of the moral influence of a large influx of such cases into a hospital, could be easily met by assigning special wards, or additional buildings, for their reception.

During the same year,\* at other places, and especially in this country, cholera patients were excluded, unwisely as I think, from nearly all the hospitals, except those specially opened for the purpose. In many, no doubt, the idea of its communicability operated as the immediate cause; in others, various prudential reasons, which would not probably be urged in case of the future recurrence of the disease; but for the exercise of which, most ample excuse if not justification may be found in the excited state of the popular mind, and, still

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\* 1849.

more, in the then unsettled state of medical opinions as to its contagiousness.

The London College of Physicians, in a letter of advice to the Privy Council, in October, 1848, say, that "Cholera appears to have been very rarely communicated by personal intercourse," and that "all attempts to stay its progress, by cordons or quarantines, have failed." The somewhat cautious language of the first part of the opinion, may perhaps have been suggested by a recollection of their advice in 1831, which was founded upon their belief in its highly contagious nature. Indeed, with a few individual exceptions, so general is the testimony in support of the doctrine of the non-contagiousness of cholera, it is that now adopted by the principal medical authorities of Great Britain and the continent, as it is certainly by those who are most familiar with it in this country.

With regard to Variola, it may be remarked, that, although next to the plague it has been, more than any other disease, the subject of restrictive quarantines; yet that the general introduction of the practice of vaccination has done a great deal more to limit its spread than any discredit of its conta-

gious properties. These, I think, cannot be disputed, although they have been unquestionably exaggerated.

There is no doubt that the disuse of quarantines for Variola, by compelling a more general resort to the efficient prophylactic power of vaccinia, has been the indirect but powerful means of greatly reducing the mortality and prevalence of the disease. With the abolition of quarantine hospitals, however, sufficient provision has not been made for its treatment elsewhere.

Yellow Fever has long been a favorite subject for the exercise of quarantine regulations. There is, at present, I believe, a very general agreement among the physicians of this country with the opinion of Dr. Rush, as to the non-contagious nature of this fever. M. Louis, for a translation and publication of whose admirable work, upon the epidemic Yellow Fever of Gibraltar, we are indebted to a member of this Society,\* does not touch this question, except to refer to the papers of M. Trousseau upon the mode of its propagation. Still, a fair inference from his own experience would lead us to deny its contagiousness.

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\* Dr. G. C. Shattuck, Jr.

Yellow Fever has visited this city within the past sixty years, four times, — in 1798, 1802, 1819, and in 1835. It is quite a remarkable fact that it has always exhibited itself in and about the same locality on every occasion, — in the neighborhood of Fort-Hill: being apparently evolved from miasmatic materials, which, from the experience of the year of the cholera, (1849,) there is reason to suppose are still deposited in the imperfectly drained streets about the lower parts of the hill.

In several of these instances the fever was supposed to have been imported; but in the most quoted and very familiar case of the "Ten Brothers," the disease was perfectly well proved to have existed, in several instances, long before her arrival.

In 1835, there were a few cases of Yellow Fever of a distinctly marked character, all of them originating in the same neighborhood, also the fruit doubtless of the same deadly seed. The cargo of a vessel from South Carolina, which was discharged at Central Wharf, seemed, in this instance, to be the exciting and concurrent cause. This disease, then, having established for itself no claims to the character of a contagious one, is not, therefore, a proper subject for quarantine.

The Typhus of Great Britain, or Ship Fever, is a disease comparatively new to this country; but it is one to which much attention has been attracted, since the floods of emigration from the old world have deposited it, — a most noxious detritus, — upon our shores.

As a disease which has, from the nature of its origin, and the character of its subjects, compelled for itself some special legislation, it is deserving of particular notice. Having the property, as I am confident, of reproducing itself, under certain circumstances, the principal of which are, want of ventilation and overcrowding, — whether on ship-board, at emigrant station-houses, in hospitals, or elsewhere — unless these conditions are present, and the poison of the disease has become accumulated, it does not thus reproduce itself. That is to say, it is usually only contagious when the presence of concurring circumstances makes it so. Highly amenable to sanitary measures, and rendered comparatively harmless by them, it becomes most malignant and contagious by their neglect. Under these circumstances, and for the purposes *only* of a convenient enforcement of other sanitary measures,

such as the purification of emigrant vessels, or the cleansing and dispersion of the sick, the maintenance of quarantine establishments may be considered as of the highest importance. But this remark may be applied also with equal propriety to the other zymotic diseases, which are confessedly non-contagious.

Carried beyond this point, quarantines are not only useless, but injurious, because their rigid enforcement renders impossible the employment of any mitigating agencies,—embarrasses commerce,—subjects travellers to all kinds of annoyances, and dangers,—in fine, aggravates, in a material degree, all the evils they are intended to alleviate or avert.

We conclude, then, as the result of our examination of the facts,—

1. That all quarantines are based upon the theory of the contagiousness of the diseases whose spread they are intended to limit; and that the soundness of this hypothesis is therefore essential to its support.

2. That it has been satisfactorily proved that the

Plague, Cholera, and Yellow Fever, are not contagious ; and that the admitted contagiousness of Variola is much more effectively controlled by vaccination than by any possible quarantines.

3. That, with regard to Ship Fever, it seems to be quite settled, if at all a proper subject of quarantine, it is so only in a modified degree, and with the exceptions already stated.

4. That quarantines have no effect in controlling epidemics.

5. That being not only useless, but pernicious, they ought to be abolished ; and the more rational and philosophical systems of modern sanitary reform substituted for them.

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Society is composed of two great classes ; the one consisting of those who have the means or the capacity, (the possession of the former commonly implying the latter,) to take care of themselves ; and the other and more numerous class, of those who have not either of them. The duty of the one to provide for the other, is not less clear than

that it is also the course which is indicated by the instinct of self-preservation.

The question of public health is a matter in which all classes are equally interested: the poor, first, because they suffer most directly; those who are not poor, because they must also feel the consequences of a neglect of sanitary measures, if not immediately, yet ultimately and inevitably.

The objects proposed to be accomplished, by an exercise of the reforms suggested by sanitary science, are two-fold; in the first place, to limit, as far as possible, the agency of that large class of diseases, especially, to which the term *Zymotic*\* has been applied; and in the next, to elevate, by suitable

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\* The term ZYMOTIC has been usually applied to the large class of diseases enumerated in the following list, viz.: Cholera, Croup, Diarrhœa, Dysentery, Erysipelas,—Remittent, Intermittent, and Typhus Fevers,—Pertussis, Influenza, Rubeola, Scarletina, Small-pox, &c.; i. e. "All such diseases as are known to be epidemic, endemic, or contagious, under any circumstances." The word itself signifies, a *fermentation*, and has been used, either from the ancient notion that the pestilential constitution of the atmosphere was the result of a liberation of miasmatic gases, during a sort of fermentation of its poisonous particles; or, from their disposition, like *leaven*, to impregnate the whole mass whenever placed in a favorable contact with it.

means, the general standard of the health and vigor of the masses of the people.

The importance of these measures will be at once conceded, when it appears, by a reference to the most reliable bills of mortality, that the deaths from zymotic diseases alone, amount to more than fifty-five per cent. of the whole ; especially, since it is now ascertained that a very large proportion of this mortality may be fairly assigned to causes which in themselves are quite removable.

Epidemic diseases occupy a very prominent place in this class, and are among the most mysterious and inexplicable manifestations of natural causes. Whether they are of atmospheric or telluric origin, is a problem which is not yet solved. Their ultimate laws are entirely beyond our comprehension, and can be observed only when they show themselves to our senses by a combination with other and more appreciable causes. We witness their effects upon the bodies of the living and the dead, and are yet as far from a discovery of their actual origin as the most ignorant. The pathological changes may be noticed, — the state and chemical composition of the fluids and solids may be carefully observed ; — but we can go no farther.

The atmospheric changes, — the seasons, — the climates in which epidemics occur, — may all be accurately registered. The pestilence still moves on its deadly way, nor leaves a trace by which we can ascertain what was the formulary by which these epidemic influences were compounded, or what must have been the fatal force with which the organic elements entered into the combinations necessary to produce such terrific results. But if we know nothing of these ultimate causes, yet we have learned something of the proximate laws which govern the manifestation of epidemic influences upon the human body. The local, exciting or concurring causes, without which epidemics would not be destructive, are the legitimate objects of our study, and it is the removal or modification of these which it is the province of a preventive medical police to superintend, and of sanitary science to expound.

All epidemic diseases have a few general characteristics which are common to all, while they also differ materially from each in many other respects. Yet there are marginal cases, whose phenomena apparently indicate a common origin, and in which one class seems to pass by an easy transition into

another; — as, for example, cholera into typhus, — typhus into the plague; the latter disease being, according to some authorities, only a form of fever, modified by circumstances of climate or location. Epidemics have been aptly compared, by some one, to the “shears of fate;” one blade being the atmospheric influence, the other, the local preparations to receive it; both being necessary to the full development of the disease.

As it seems now to be a settled medical opinion, that epidemics will not establish or spread themselves, unless a certain class of circumstances have a concurrent action with them, it becomes important to inquire what these conditions are, and how they may be rendered inoperative.

These causes are now well ascertained, and easily recognisable. They are found to exist abundantly in the filthy and crowded abodes of the laboring classes of large cities, where there is an entire absence of cleanliness and ventilation — an insufficient supply of pure water and an imperfect drainage; in closely-built neighborhoods — particularly in courts to which there is but a single entrance, and from which there is no outlet; in natural defects of soil,

or its impregnation with offensive effluvia from various decomposing substances ; in proximity to burial-grounds, open sewers, stagnant water, or noxious manufactures.

*Bad Ventilation.* Of all the localizing causes of cholera, and indeed, of other epidemics, none holds so prominent a place as bad ventilation. The reason of this is obvious enough, because it almost necessarily implies the presence of all the other most essential causes. It may be more correct, perhaps, to say that neither of them can be present to any extent without producing a bad atmosphere.

The curious observation made by Mr. Adams, of Glasgow, that a much larger proportion of cases and deaths from cholera occur during the night, than during the day, has been noticed here, — a fact easily understood by those who have ever visited at an early hour any of the tenements in affected localities, especially those under-ground. The odor, even where there is no sickness, and only the common causes of filth and over-crowding are present, is often intolerable. The inhabitants themselves may often be seen crawling out of them, in the morning, looking almost as carbonized as if

they had just been drawn out of a cess-pool or a stagnant well, rather than as if they had but now arisen from what ought to have been a refreshing sleep.

These are the circumstances under which cholera has always prevailed here and elsewhere.

*Over-crowding.* I have no accurate means of ascertaining the number of inhabitants in this city who inhabit by families single rooms, in large or small tenements, the whole of which are occupied in the same way. I should think, however, that twenty-five thousand was a moderate estimate. The greater part of them live in houses either not originally intended for dwellings, or, if so, calculated only for the accommodation of a much smaller number of persons, usually only a single family, in each.

The upper and lowest rooms are the most unhealthy. The lower ones, from proximity to ordinary sources of impurity, and want of air; — and the upper ones, because they receive the combined exhalations from all the occupants below them. Besides, the inhabitants of the upper stories are seldom supplied with sinks, or any other means of

removing the waste of the family. If we add to this, the great labor required to carry up to these apartments a sufficient supply of water, even for ordinary purposes, we need not be surprised at what seems at first an unreasonable fact.

These circumstances will also explain why large tenements are so liable to epidemic disease, aside from the general considerations of a sanitary nature, which, of course, are also in constant operation.

*Intra-mural Sepulture.* Although we, who live in cities which in comparison to those of the old world are of but recent growth, can hardly comprehend, from our own experience, how terrible are the evils from which they have suffered,—we have yet not wholly escaped them.

That the interment of the dead, in large numbers, in the close vicinage of dense masses of the population, must be injurious to the public health, is so self-evident a proposition, that I shall adduce no proof in support of it, save a few facts, in relation to some of our own burial-grounds, which have been brought under my personal notice.

The burial-grounds at East and South Boston are the only ones where graves have been permitted for

many years. That at East Boston is still quite new, and unobjectionable as to its location. That at South Boston is attached to Saint Augustine's Church, and contains a great number of bodies. It is situated on the north-western slope of Dorchester Heights, in the direct neighborhood, and affecting the drainage, of a large population. The soil is a mixture of clay and gravel, overlying a shelving floor of slate, down to which many of the graves are dug.

These, from the various motives of a religious nature, or of others less commendable, are frequently re-opened, and fresh bodies deposited in them, until, in some instances, they have been left above the surrounding level of the earth. Great complaints, not unreasonably, have been made of this state of things; and the authorities have so far interfered as to have materially abated the nuisance.

There is a burying-ground on the north side of Copp's Hill, the result I believe of private enterprise, the tombs in which have been a frequent source of annoyance, if not of sickness, to the block of houses immediately adjoining, on the street below

them. It has been necessary in the warm season, sometimes, to close the windows, to keep out the noxious effluvia from the burial-ground, when the wind blows toward the houses.

On the north-east side of the Hill there were, in 1848, four cases of Malignant Cholera, two of which were fatal. I have frequently seen cases of fever in the same cluster of houses. They were subjected to the surface drainage from the grave-yards, and to no other apparent exciting causes of disease.

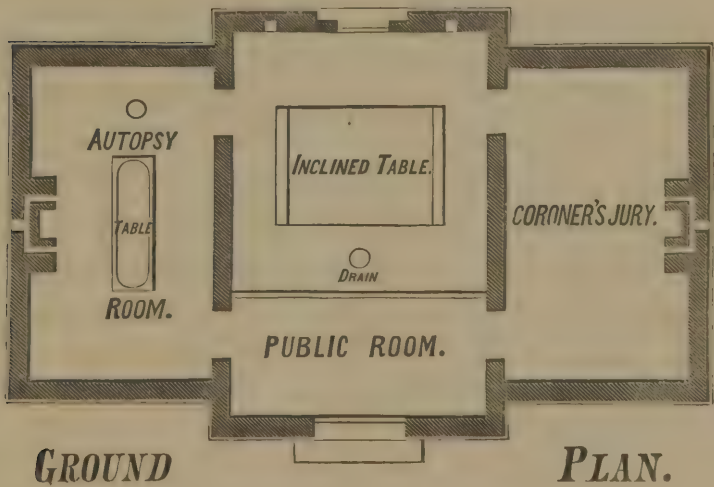
Complaints of the same nature have been made of the tombs in the burying-ground on the Neck, which is in the immediate vicinity of one of our finest public squares. Some of them have, in consequence, been permanently closed. The practice of clearing out the public and other tombs, at stated intervals, for the purpose of refilling them, is, I think, nearly abandoned.

The establishment of RURAL CEMETERIES, the plans for which are now so rapidly progressing in various directions around the metropolis, will do much towards removing these causes of public complaint.

For the purpose of remedying others, of a more



HOUSE OF RECEPTION, NORTH GROVE STREET.



private but not less important character, I have lately procured, for the City Government, plans for the construction of a suitable place of temporary deposit for the Dead. This structure, (see engravings on page 35,) will, I think, fulfil all the necessary sanitary conditions, and, at the same time, save many distressed families, from the pressure of circumstances, which are frequently of so revolting a character that no description can give any adequate idea of them.

As a matter of great convenience in many respects, its uses are so obvious, that it is not necessary to specify them.

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Of all the means for the improvement of the sanitary condition of a great city like this, none can be compared in utility with an abundant supply of pure water. Since this has been accomplished for Boston, we have experienced, among numerous other benefits, a very great improvement in the whole system of drainage. Extensive and expensive measures, within the past two years, have been in progress, under the direction of the City Government,

to perfect the sewerage of the Neck lands, of the South Cove, and the Back Bay. Our facilities for flushing with the Cochituate, and for discharging the drains every where into tide-water, are so ample, as to leave nothing more to be desired in this respect.

The subject of *model-houses or dwellings for the laboring classes*, is one which would repay a more thorough investigation than it is possible for me to give. The erection of such a class of houses in suitable locations, and in sufficient numbers and of sufficient capacity to furnish the necessary accommodation, would, I have no doubt, accomplish a greater sanitary improvement than any and all other measures.

Most satisfactory experiments to this end have been made in Great Britain, and have settled the point that buildings may be erected in this way, which, at remunerating rents to the proprietors, will furnish to the poor, at a less price than they now pay, tenements which are supplied with all the modern sanitary improvements.\*

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\* See North American Review, July, 1851, and April, 1852, for interesting articles on these subjects; see also, a Lecture by

The establishment of another Hospital, within the limits of the City, which should receive the class of cases now necessarily excluded from existing establishments, — and which would therefore avoid the objection of an interference with either of them, — is, in my judgment, a most desirable measure. Its doors should be open for the reception, at all hours, of Variola, Typhus, or Cholera, either during a general prevalence of those diseases, or at other times; and of those who, from want of room, or other circumstances, cannot be received elsewhere.

Such an institution should not be an alms-house, or be at the charge of the City; although, as a measure of economy, it could well afford to appropriate for such a purpose a square of its unoccupied territory, whenever private or corporate funds to the requisite amount should be pledged for its support.

The Boston Dispensary could make no wiser disposition of its present and prospective ample resources, than to appropriate them for this purpose.

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Dr. C. E. Buckingham, on the "Circumstances affecting individual and public health."

But, as I have already intimated, it will be impossible on this occasion to discuss more fully the many interesting subjects which are legitimately connected with the great Sanitary Reforms of the present day; or, to consider at all the organizations by which they can best be carried out.\* And, although this is a matter, the practical workings of which must be generally left to municipal authorities, it is well to look at it as one which concerns each member of the social community, and as one which it is, to say the least, quite as important should be thought of in a time of general health as at any other; for it is quite doubtful if the spasmodic efforts which are excited during the progress of a severe epidemic, are not often productive of results rather hurtful than beneficial.

We are the members of a profession which has had, in all ages, and which must continue to have, a great influence, directly and indirectly, upon the opinions and practice of those whose province it is to enact or execute the laws which relate to the public health. Whatever may be said to the con-

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\* See the Report of Massachusetts Sanitary Committee.

trary, and however frequently the current of popular belief may be temporarily disturbed or diverted by the mushroom theories of the day, it should be a source of some satisfaction to us to be assured, by the experience of many past occasions, how universally the members of the regular medical profession will always be relied upon for counsel and assistance in the great emergency of an epidemic.

These considerations should then stimulate us not to neglect the study of those laws by which, as we have seen, the diseases included under the general term, ZYMOTIC, may be effectually controlled; for, of all the sciences which are more or less intimately and collaterally allied to our profession, none can bring to its service more appreciable or "material aid," in the fulfilment of its noble ends, than that branch of it now known and most appropriately designated as THE SCIENCE OF PREVENTIVE MEDICINE.

